

BUS RAPID TRANSIT: IT'S NOT JUST FOR BIG CITIES ANYMORE



IN motion 2012 MPO Conference October 17, 2012

What exactly is BRT?

			CHINESE MENU				
		Appetizers	6000	Chow Mein		Egg Foo Young	A .
	C36	Egg Roll1.60	STATE OF THE PARTY	(Served with White Rice & Crispy Noodle)	-	(Served with White Rice)	COMPO DI ATE
14		Vegetable Roll1.50	1	Sm. Lg.	10000	Lg.	COMBO PLATE
The same of the		Spring Roll (Shrimp)	Sour L	C78. Chicken, Pork or Veg 6.50 8.95	Part S	C202. Chicken or Pork or Vegetable (3pcs)8.75	
and the last		Cheese Rangoon (6)4.50	C81. Sweet & Sour	C79. Shrimp or Beef 6.95 9.50	4	C203. Shrimp or House Special (3pcs)9.25	Lunch (11:30am-3:00pm)
-		Dim Sum (6) Shrimp and Pork5.95	C81. Sweet & Sour Chicken	C80. House Special	12	Seafood	Includes Fried Rice and Sods. Eggs ReVada \$1.00 e
77.00		Chicken Wings (8)		Sweet & Sour	15-2	(Served with White Rice)	Dinner (All Day)
L Spring Roll		*Honey Garlic Wings or Spicy Wings (8) 7.95		(Served with White Rice)	0.44 0.1	Sm. Lg.	includes Egg Roll, Fried Rice and
		Cold Sesame Noodle	división.	Sm. Lg.	C109. Shrimp with Lobster Sauce	C109. Shrimp with Seafood Sauce 7.9510.95	Choice of Worldon, Mixed, Mise or Hot & Sour Sou
The State of the S		Chicken Dumplings (6)	(Parties of the last of the la	C81. Chicken or Pork 6.959.50		C110. Shrimp with Broccoli or Mix Vegs. 7.9510.95	Lunch
E IV		(Steamed or Pan Fried)	A POLICE TO	D82. Shrimp11.50		C111. Shrimp with Snow Peas or String Bean 11.50	C1 Chicken or Roast Pork Chow Mein 5.95
		Pork Dumplings (6)		Pork	1200	C112. Ginger Spicy Shrimp11.50	C2 Sweet & Sour Chicken or Pork 5.95
		(Steamed or Pan Fried)	The state of	(Sarveg with White Rice)	THE WAY	C113. Szechuan or Hunan Shrimp11.50	Gz sweet a sour Unicken or Pork 5.95
		Fantail Shrimp (5)7.95		Sm. Lg.		C114. Kung Po or Garlic Sauce Shrimp 11.50	C3 Chicken or Pork Lo Mein 5.95
Cheese Rangoon		Teriyaki Chicken Sticks (4)6.50	C88, Meo Shu Pork	C83. Pork with Mix. Vegs or Broccoli6.95 9.50		C115. Shrimp with Cashew Nuts11.50	C4 Honey Garlic Chicken
		Teriyaki Beef Sticks (4)8.50		C84. Pork with String Bean or Snow Peas .9.50		C116. Thai Curry Shrimp12.95	G4 Honey Garric Chicken
W 100 M		BBQ Ribs (6)	The state of the s	C85. Pork with Black Bean Sauce		Vegetarian Special	C5 Buddha Delight (Tofu & Vegs) 5.95
		BBQ Boneless Ribs8.95	200	C86. *Pork with Garlic Sauce9.50	C110, Shrimp with Mix Vi	(Served with White Rice)	C6 Beef or Shrimp Chow Mein 6.50
	C51,	Appetizer Combo (for 2)	Market Street	C87. Szechuan or Twice Cooked Pork9.50		Sm. Lg	
No.		2 Wings and 2 Cheese Rangoon	- Was a second of	C88. Moo Shu Pork (Served with 4 Wrace)9.95	-	C117. Buddha Delight (Tatu & 1/02) 6.958.95	C7 Chicken or Pork w/ Mix. Vegs 6.50.
Reserve	C52.	French Fries		Beef	and Trainfor	C118. Broccoli or String Bean	C8 Beef or Shrimp with Broccoli 7.50
. Teriyaki Beef	C53.	Steamed Wonton (10)4.95	1 1 Total	(Served with White Rice)		in Garlic Sauce	
ks		(with Sesame or Szechuari Sauce)	AND DESCRIPTION OF THE PARTY OF	Sm. Lo.	100	C119. Szechuan or Hunan Tofu 6.95 8.95	C9 Pepper Steak with Onions
			C89. Beef with Broccoli	C89, Beef with Mix, Veg.or Broccoli 7,50.,10,50		C120. Kung Po Tofu or Ma Po Tofu . 6.959.50	C10 Chicken with Cashew Nuts 6.50
-		Soup		C90. Pepper Steak with Onions 7.50 10.50	And.	C121. *Curry Tofu & Veg	
		Served with Crispy Noodle Sen. La.	1200	C91. Beef with Snow Peas or String Bean 10.50	C117, Buddha Delight	C122. Sesame or General Tofu 6.959.50	C11 Kung Po Chicken 6.50
A SECOND	CEA	Egg Drop Soup	A A	C92. Beef with Black Bean or Oyster Sauce 10.50		C123. Eggplant in Garlic Sauce 6.959.50	C12 Shrimp with Seafood Sauce 7.50
		Wonton Soup		C93. Mongolian Beef10.50	A STANSON	Diet Watcher	010 1011 0 10 10 0 100
Worton Scup		Mix (Wonton & Egg Drop) 2.25 3.95		C94. Szechuan or Hunan Beef10.50	A STATE OF THE STA	(Served with White Rice, Brown Rice \$1.00 Extra)	C13 *Chicken or Pork Garlic Sauce., 6.50
. Tremen usup		*Hot & Sour	The same of the sa	C95. Kung Po Beef10.50		C124. Steamed Mix. Vegs	C14 Szechuan or Hunan Chicken 6.50.
and the same of		Chicken Rice Soup 1.953.75		C96, Thai Curry Beef11.95	1	C125. Steamed Chicken and Mix. Vegs 9.50	C15 Thai Curry Chicken
100		Roast Pork Rice Soup	C90, Pepper Steak with Onions	C97. Moo Shu Beef (Served with 4 arraps)10.95		C126. Steamed Chicken & Tofu w/Mix, Vegs9.95	
1/2		Chicken Noodle Soup	with Onions	Poultry (White Meat)		C127. Steamed Shrimp with Mix. Vegs 10.95	C16 General or Orange Chicken, 7.50
Barton .		Roast Pork Noodle Soup 2.504.50	200	(Served with White Rice)	C129. General Chicken	C128, Steamed Shrimp and Chicken with Vegs .11.50	C17 Sesame Chicken
3 3 3 3		Tofu & Veg. Soup	and the	Sm. Lg.	GINEROII	A-1 C1-W	
1 100		House Wonton7.25	1 300 18/10	C98. Chicken with Mix. Vegs or Broccoli 6.959.50		Asian Specialties	C18 BBQ or Boneless Ribs
Shrimp Le Mein				C99. Honey Garlic Chicken 6.95,9.50	Carried Control	(Seneral Chicken	C19 Moo Goo Gai Pan
		o Mein (Soft Noodle)		C100. Moo Goo Gai Pan 6.959.50			1/41074967050
MAN SON		Sm. Lg. Veg. Chicken or Pork	C99. Honey Gartic	C101. Szechuan or Hunan Chicken9.50		C130. Volcano Shrimp	C20 Chicken with Mushrooms 6.50.
-34			Chicken	C102. Kung Po Chicken	7	(Chicken and shamp with mixed vegs)	C22 Chicken or Pork Chow Fun 7.50.
1		Shrimp or Beef	077	C103. Chicken with Garlic Sauce9.50	A LANGE OF THE PARTY OF THE PAR	C132. Orange or Sesame Chicken	
1 Page 12	C66.	House Special 6.50 9.95	- Sandan	C104. Chicken with Black Bean Sauce9.50		C133. Triple Wonder	C23 Teriyaki Chicken Stir-Fry 6.50.
THE STATE OF THE S				C105. Chicken Cashew Nuts9.50	C132, Sesame Chicken	(Shirito, choken, and pook with mixed vegetables in sproy	C24 Pineapple Chicken 6.50.
43		Rice Noodle	A STATE OF THE PARTY OF THE PAR	C106. Chicken with Snow Peas or String Beans 9.95	GHUNCH	black been souce)	C25 Szechuan or Hunan Shrimp 7.50
Beef Chow Fun		(Chow Fun/Mei Fun)		C107. Thai Curry Chicken10.95	A STATE OF THE STA	C134. Asian Grill Chicken or Beef	
		La.	777	C108. Moo Shu Chicken		Terripolit (35LICE)	C26 Shrimp with Garlic Sauce 7.50
1-0-	C67.	Chicken, Pork or Veg9.95	G102, Kung Po	Joe Ven William William	A STATE OF THE STA	C135. Boca Supreme	C27 Double Delight
138 M - 1527- \	C68.	Shrimp or Beef10.95	Chicken		1	(Chicken, strimp and scaling striffied with origin and scallion in a special brown spicy sauciti	(Strong and Chicken with Mix, Yegs)
	C69.	House Special11.50	The second second		1	C136. Four Forty One	
1	C70.	Singapore Curry 10.95	28/28	95 FAMILY PACK	CR1 Beef with	(Chicken, shring) and polk with mixed vegetables in spicy	C28 Chicken Wings 6.50
A COST		Pad Thai (Chicker or Tota)10.95	A STATE OF THE PARTY OF THE PAR		String Bean	partic sauce)	C29 House Lo Mein
	C72.	Pad Thai (Shring & Chicken)12.95		Served with (Lg) Wonton or Egg Drop Soup. (Lg) Egg Fried Rice and Cheese Rengoon (6)	85	C137. Orange or Sesame Beef13.95	(Stiring, Chicken & Pork)
Singapore		Fried Rice	No. 10	(Lg) cgg Fried Fice and Creese Hangoon (b) and choose 2 of the following:		C138. Sesame Shrimp13.95	C31 Mongolian Beef
y Mei Fun		Sm. La	Contract	(Lg) Chicken or Pork with Mixed Vegetables	affects	C139. Happy Family14.95 (Shrimp, chicken, pork and beef with mix veg.)	
Young Chow	C73	Veg, Chicken or Pork 4.958.25	N. Contraction	(Lg) Broccoli or Chicken with Garlic Sauce	The state of the s	C140. Seafood Delight	C32 Empress Chicken
d Rice	C74	Shrimp or Beef 5.95 8.95	THE COUNTY OF THE PARTY OF	(Lg) Teriyaki Chicken Stir-Fry	7	C141, Thai Red Curry Chicken	
MAN TO	C75	House Special	1	(Lg) Sweet & Sour or Honey Garlic Chicken &	Carl Hill	C142. Thai Red Curry Beef	C33 Shrimp Cashew Nuts7.50.
1.000.1		Young Chow	Table 3	(Lg) General or Sesame Chicken		C143. Scallop and Shrimp in Spicy Garlic Sauce.14.95	C34 Kung Po Shrimp7.50.
ALT THE		Veg Fried Brown Rice 5.958.95	C103. Chicken w	(Lg) Vegetable or Chicken Lo Mein		C144. Volcan Chicken	A CONTRACTOR OF THE CONTRACTOR
1000	3		Garlic Sauce	LiCannot be combined with any other offer and coupon!		Choice with not red sweet & spcy-secon	C301 Pad Thai Chicken or Tofu 7.50.
- The 30			000000000000000000000000000000000000000		Chicken Lo Mein	₹ Hot & Spicy	



Elements of BRT

□ No two BRT lines are alike.

Huge menu from which to choose ingredients.

- □ Use various elements that:
 - □ are available
 - are compatible with traffic and transit operations

Where BRT Works Best

Medium-length to long bus route corridors.

 Where bus speeds are significantly slower than average auto speeds.

Where demand and potential exist to attract riders by providing a more competitive travel time.

What puts the "Rapid" in Bus Rapid Transit?

When the bus is in motion, it moves as fast as possible.

When the bus is stopped, keep the "dwell time" as short as possible.

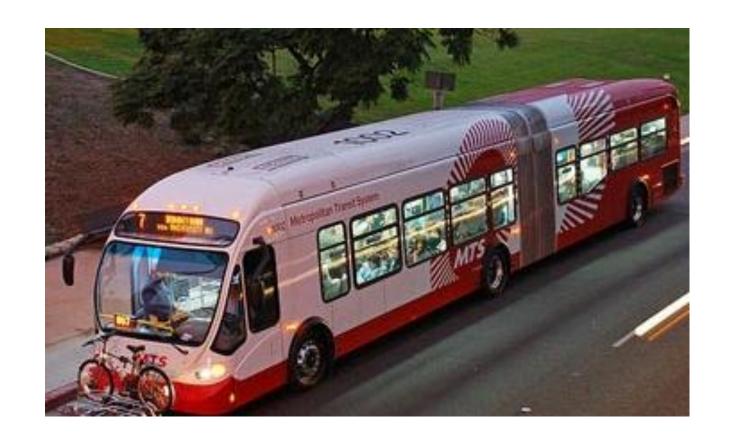
□ Stop as infrequently as possible.

Does Size Matter?

System Size: Not really

Federal Funding: More than likely

TOD: Probably

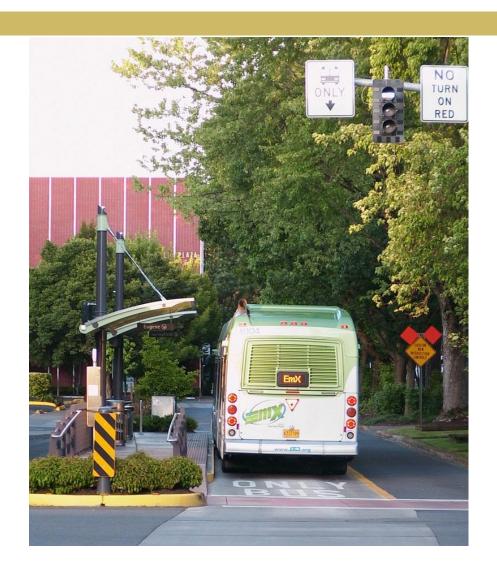


Elements of BRT

Exclusive Right-of-Way

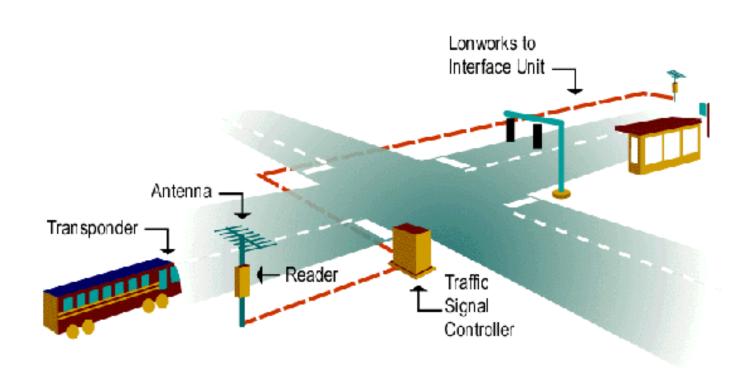


Bus-Only Lanes

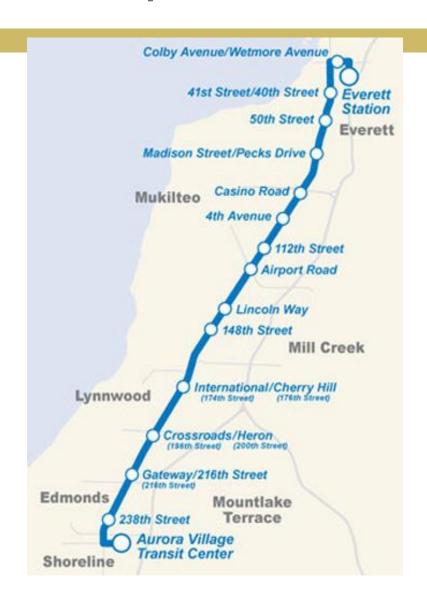




Preferential Traffic Treatment



Fewer Bus Stops



Faster Boarding and Exiting





Reliability, Convenience, Comfort and Safety

- □ Convenient all day service
- High capacity vehicles
- □ Clean and quiet buses
- □ Real time "next bus" information
- High quality, attractive styling
- Unique brand identity
- Distinctive stations



Today's Trend: Arterial BRT

(AKA: On-Street BRT, BRT Lite, Enhanced Bus Corridor)



Charlotte, NC



Ft. Worth, TX



Kansas City, MO



Houston, TX



Nashville, TN



Seattle, WA





The future of transit in the Roaring Fork Valley























The Importance of Stations

Comfort

- Weather protection
- Waiting facilities
 - seating
 - leaning
 - standing
- Sufficient space for everyone



Accessibility

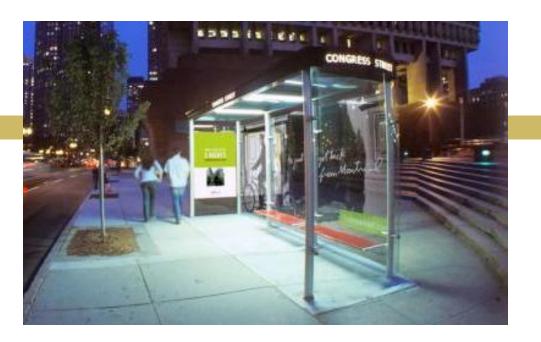
ADA Compliant

- Accommodate persons with wheelchairs
- Meet needs of visually impaired persons
- Bicycles
- Not obstruct pedestrian movements along sidewalks



Safety

- Openness
- Visibility
- Lighting
- Link to emergency services
- Discourage loitering



User Experience

- System marker
- Station name
- Real-time "Next Bus"
- Static information:
 - System map
 - Route map
 - Schedules
 - Announcements



Community Experience

- Enhance urban
- Use solar power?
- Not interfere with businesses:
 - Access
 - Visibility
- Be well-maintained



Flexibility/ Adaptability

- Possible modular design
- Ridership levels at station stop
- Site conditions and constraints
- Maintain consistent look



BRT SHELTERS

Distinctive / Branded Design





Design/Procurement Approaches

- Use an off-the shelf "stock" shelter.
- Modify a stock shelter.
- Commission a unique design, contract with a shelter manufacturer to fabricate.
- Commission a unique design, contract with a specialty fabricator.

Unique design specially fabricated



Kansas City, MO MAX

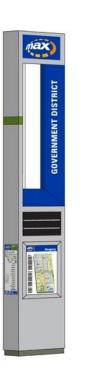














Average cost per station/shelter: \$300,000

Seattle, WA RapidRide





Custom design by shelter manufacturer



Duo-Gard Industries Canton, MI

Albany, NY BusPlus



Duo-Gard Industries Canton, MI



St. Paul, MN



Columbus, OH



Tampa, FL



Madison, WI





LNI Custom Manufacturing Hawthorne, CA

Minneapolis, MN MARQ2



LNI Custom Manufacturing Hawthorne, CA



Palm Desert, CA



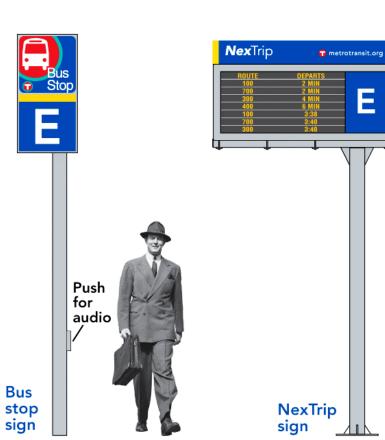
Santa Monica, CA



West Sacramento, CA







"Stock" Shelters



Austin-Mohawk, Inc. Utica, NY





Tolar Manufacturing Corona, CA





Atlanta, GA Sonoma, CA

Brasco International Madison Heights, MI









Arterial BRT: Examples



Snohomish County, WA

Swift BRT

Community Transit

- Fleet: 239 buses
- Annual ridership: 9.2m
- Annual operating budget: \$104m
- Dedicated funding source: sales tax (0.9%)
- Snohomish County service area population: 499,000 (Everett population: 104,000)

Snohomish County: Swift BRT

Sponsor: Community Transit (CT),

Snohomish County

Type: Suburban arterial

Right-side bus-only lanes

□ Length: 16.7 miles

□ Opened: 2009

□ Cost: \$29.5 million

Service and Operations

Monday-Saturday; no Sunday service.

□ 10 min. peak, 20 min. nights and Saturday.

Local buses are still in service: 20 min. frequency (CT's second busiest bus route).

Snohomish County, WA: Swift BRT















"Business Access Lanes"

- □ Along 39% of line
- Providesmotoristaccess tobusinesses
- Remaining sections operate in mixed traffic



Signal Priority

□ Along 10.5 miles of the line.

Provide buses with a slightly longer "green" at station location intersections.

Vehicles







Vehicles







Stations

□ Number of stations:12

□ Average spacing: every 1.4 miles

Most widely-spaced stations of any U.S.
 on-street BRT line.

Stations

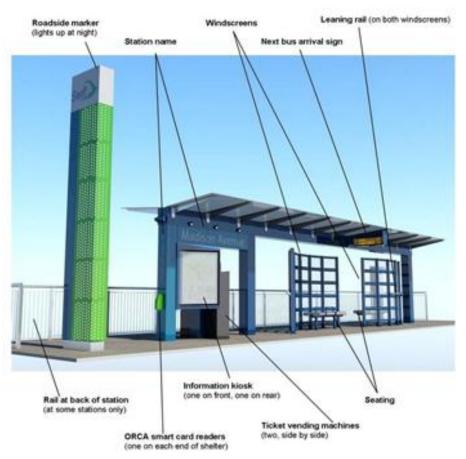




Image and Identity





Results

□ Travel time: -29%

Ridership: +25% (currently 6,000 passengers/day)

 Despite 5% systemwide ridership reduction in 2009 due to economic conditions and service cuts, Swift ridership increased 11%.



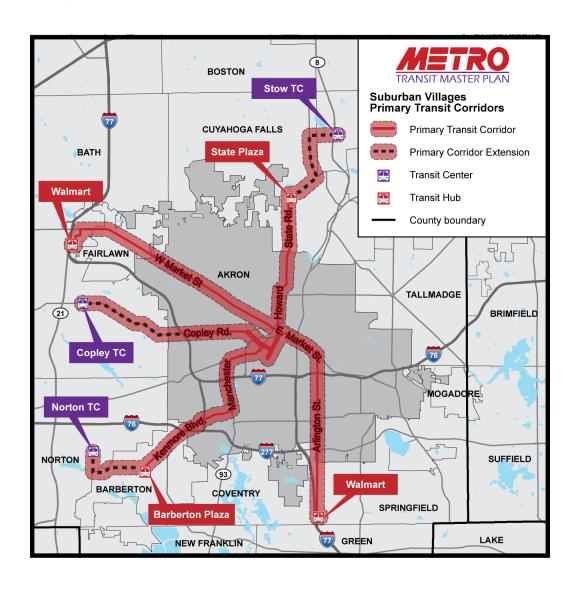
Akron, OH

Market-Arlington BRT

Akron METRO

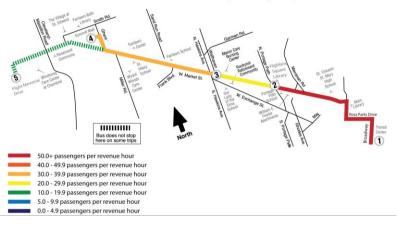
- Fleet: 201 buses
- Annual ridership: 5.0m
- Annual operating budget: \$35.9m
- Dedicated funding source: sales tax (0.50%)
- Summit County population: 540,000 (Akron population: 198,000)

Transit Master Plan Recommendation

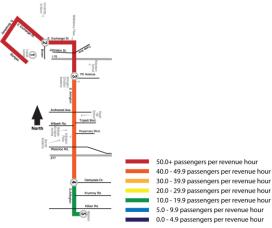


Study Area

1 West Market - 40.0 passengers per revenue hour



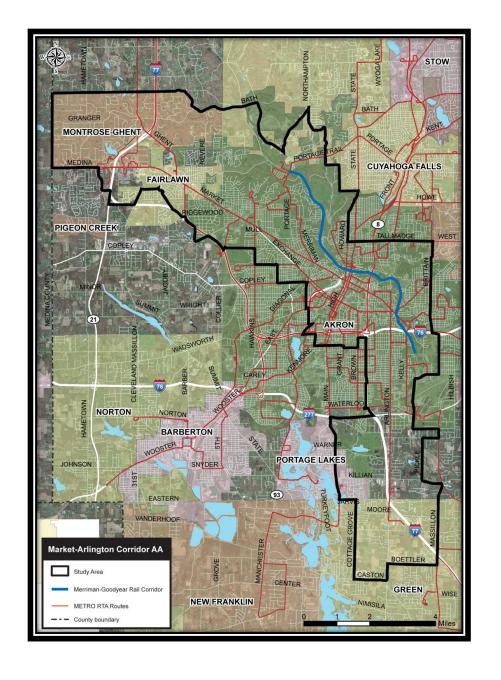




Weekday ridership:

• Route 1: 1,800

• Route 2: 1,500





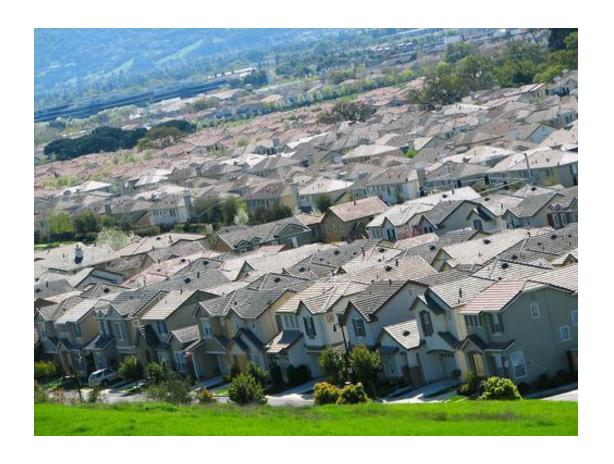




□ Purpose and Need Statement:

The Market-Arlington Alternatives Analysis Study will develop a transportation improvement that facilitates transit connections between the northwest and southeast sides of Akron, addresses overcrowding on bus routes in the corridor, improves transit service for existing METRO riders, appeals to choice riders, and promotes new development within the City of Akron.

- □ Goal 1: Improve Transit Service and Connectivity
- □ Goal 2: Promote Livability Principles
- □ Goal 3: Maximize Environmental Benefits
- □ Goal 4: Develop a Financially Feasible Project

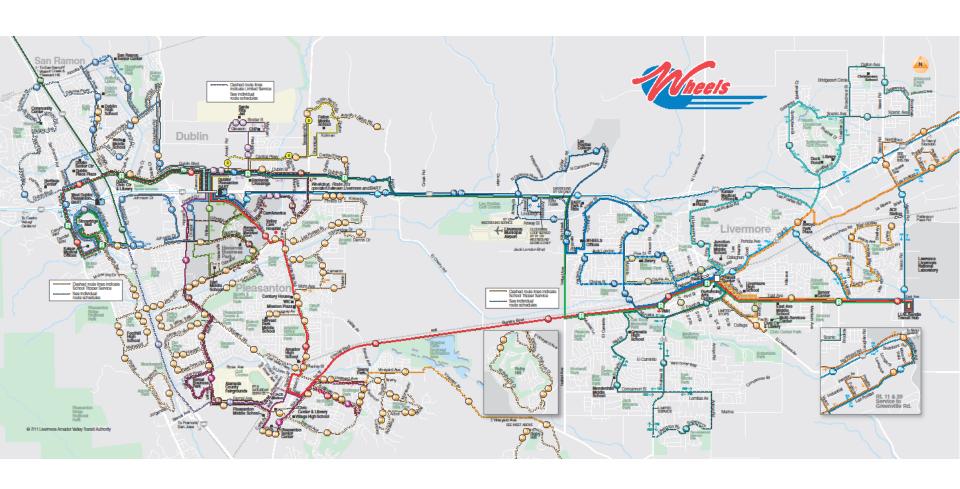


Livermore-Dublin, CA

Tri-Valley Rapid

Livermore Amador Valley Transit Authority (LAVTA, aka "Wheelsbus")

- Fleet: 71 buses
- Annual ridership: 1.9m
- Annual operating budget: \$14.1
- Dedicated funding source: state and local
- Summit County population: 200,000
 (cities of Livermore, Dublin and Pleasanton)





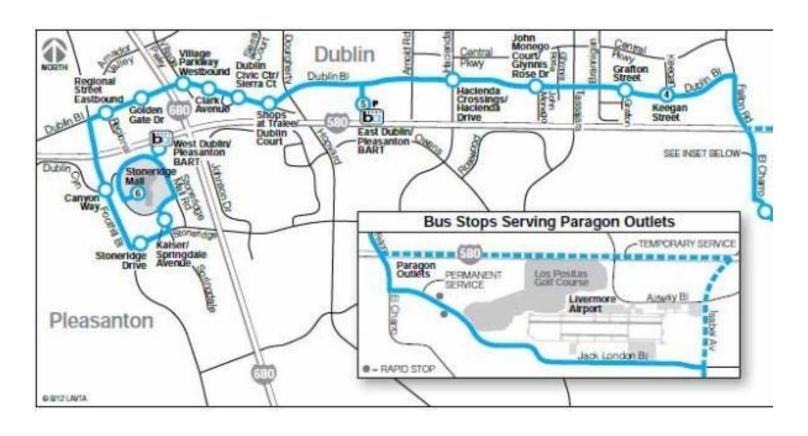


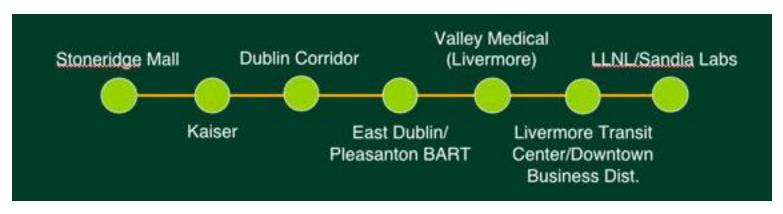
LAVTA: Tri-County Rapid

□ Buses: 14

□ Capital Cost: \$13m

□ Annual Operating Cost: \$1.8

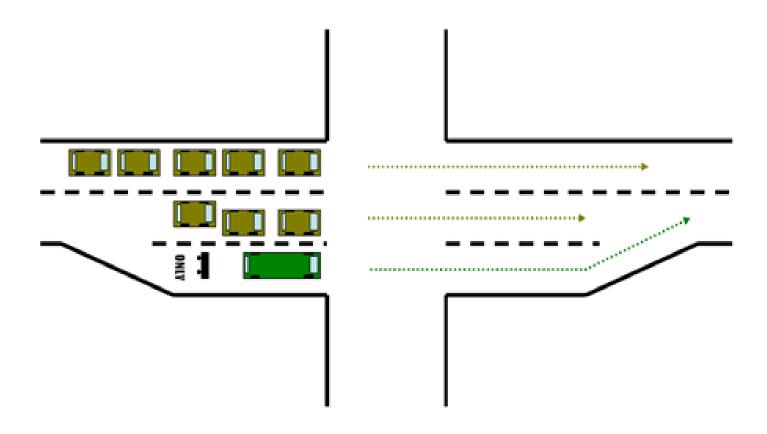








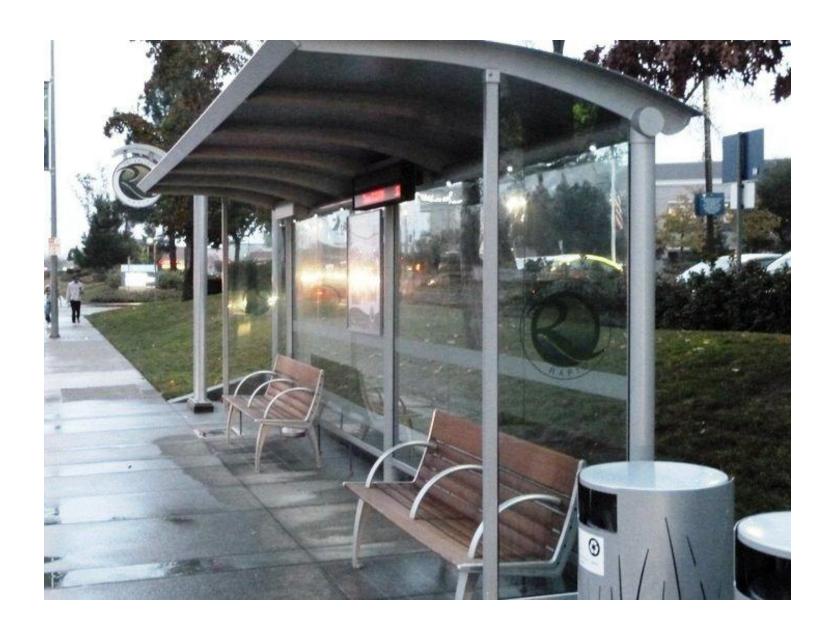
Queue Jump Lanes











Results

□ Travel time: -27%

□ Frequency: from 15 min. to 10 min.

□ Ridership: +83% projected (from 3,500 to 6,400)



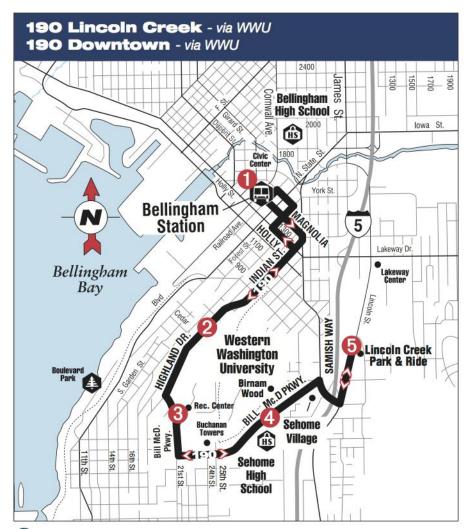
Bellingham, WA

GO Lines

Whatcom Transit Authority

- Fleet: 59 buses
- Annual ridership: 4.7m
- Annual operating budget: \$22.5m
- Dedicated funding source: sales tax (6/10 of 1%)
- Whatcom County population: 206,000 (Bellingham population: 81,100)









Route 190 is part of the BLUE Line

































BUS RAPID TRANSIT: It's Not Just For Small Cities Anymore

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